CONLEY ASSOCIATES

Memorandum

To: Mr. Robert Bray

From: Jennifer Conley, P.E., PTOE

Date: May 16, 2013

Re: Trip Generation Analysis for Proposed Mixed Use Development
            33 Mt. Auburn Street, Watertown, Massachusetts

Conley Associates, Inc. studied the trip generation impact of a proposed mixed use development to be located at 33 Mt Auburn Street in Watertown, Massachusetts. The site is located on the northeast corner of the intersection of Mt. Auburn Street and Taylor Street. The site is currently occupied by a partially demolished brick building. The site has three driveways with two on Mt. Auburn Street and one on Taylor Street. The site abuts Taylor Street which is a one way roadway exiting onto Mt. Auburn Street.

The development program consists of 2,000 square feet of retail space and 24 apartment units. Access to a portion of the on-site parking will be accessed via a driveway on Mt. Auburn Street. The remainder of the on-site parking will be accessed via Taylor Street. Because Taylor Street is a one-way roadway, access on Taylor Street will be restricted to left turn in/left turn out.

Existing Traffic Conditions

Conley Associates, Inc. assessed the existing traffic conditions in May of 2013. Automatic Traffic Recorder (ATR) counts were conducted in front of the site on Mt. Auburn Street for a 24 hour period on Thursday, May 2, 2013. Mt. Auburn Street had an average daily volume of 17,500 (9,700 vehicles traveling eastbound and 7,800 traveling westbound). During the AM peak hour (7:30 to 8:30 AM), 1,270 vehicles passed the site on Mt. Auburn Street. During the PM peak hour (5:45 to 6:45 PM), 1,230 vehicles passed the site on Mt. Auburn Street.

Future Traffic Conditions

Trip generation estimates for the development of the proposed site were based on information provided in the Trip Generation Manual, 9th Edition published by the Institute of Transportation Engineers (ITE) in 2012. Specifically, Land Use Code (LUC) 230, Residential Condominium/Townhouse, and LUC 826, Specialty Retail Center, were utilized for trip generation calculations. The resulting trip generation is summarized in Table 1.

Table 1: Trip Generation Summary

		Retail[1]	Residential[2]	Total
Weekday Daily	In	44	70	114
	Out	44	70	114
	Total	88	140	228
Weekday AM Peak Hour	In	1	2	3
	Out	0	9	9
	Total	1	11	12
Weekday PM Peak Hour	In	2	8	10
	Out	3	4	7
	Total	5	12	17

1. Based on the Trip Generation Manual, 9th Edition, 2012, published by ITE. Calculations were based on 2,000 square feet of retail and utilized Land Use Code 826, Specialty Retail.
2. Based on the Trip Generation Manual, 9th Edition, 2012, published by ITE. Calculations were based on 24 residential units and utilized Land Use Code 230, Residential Condominium/Townhouse.

As shown in Table 1, the proposed retail and residential development is expected to generate 228 vehicle trips (114 trips in and 114 trips out) over the course of a weekday. The proposed mixed use development is expected to generate 12 vehicle trips (3 trips in and 9 trips out) during the AM peak hour and 17 vehicle trips (10 trips in and 7 trips out) during the PM peak hour.

The proposed trip generation analysis took no credit for alternative modes of transportation (public transit, pedestrians, and bicyclists). The site is located within a Central Business District (CBD) with other area amenities such as shopping, restaurants, banks, and recreational facilities as well as dense residential neighborhoods. Therefore, it is likely that a portion of the trips to and from the site would be made by pedestrians and bicyclists. In fact, there are numerous Massachusetts Bay Transit Authority (MBTA) bus routes that run in and through this area. Some of these routes include express bus routes to Copley Square and Downtown (Bus Routes 502 and 504) and local bus routes to Kenmore, Harvard, Central Square, and Cambridge (Bus Routes 52, 57, 59, 70, 70A, and 71). In addition, there are local recreational facilities for pedestrians and bicyclists along the Charles River.

Traffic Increases

The trips anticipated to visit the proposed redeveloped site were distributed to Mt. Auburn Street based on existing traffic patterns. During the AM peak hour, the traffic volumes are distributed approximately equally eastbound and westbound. During the PM peak hour, traffic volumes on Mt. Auburn Street are distributed approximately 56 percent eastbound and 44 percent westbound.

The expected site related traffic volumes were added to Mt. Auburn Street to determine the percentage increase anticipated as a result of the redevelopment of the site. Table 2 below shows

the traffic increase, in percent due to the site redevelopment. As shown, the redevelopment of the site is anticipated to increase traffic volumes on Mt. Auburn Street by less than one percent during the peak hours.

Table 2: Peak Hour Traffic Increases

	Existing Volumes	Build Volumes	Percentage Increase
Mt. Auburn Street west of site			
AM Peak Hour	1270	1276	0.5%
PM Peak Hour	1230	1240	0.8%
Mt. Auburn Street east of site			
AM Peak Hour	1270	1276	0.5%
PM Peak Hour	1230	1237	0.6%

Conclusions

The proposed mixed use development is expected to generate 17 vehicles trips (10 in and 7 out) during the highest peak hour. These trips will split to travel east and west of the site on Mt. Auburn Street and will correspond to less than a de minimus increase in traffic volumes along Mt. Auburn Street. It should be noted that this assumes no credit for alternative modes of transportation such as the significant number of transit options located within walking distance of the site. In addition, due to the central business district nature of the site location, a high percentage of shopping, recreation, and even commuting trips will be done by foot or bicycle. Therefore, it is likely that the traffic impact of the proposed mixed used development will be minimal to the area.

Mt. Auburn Street (at #32)
east of Arsenal Street
City, State: Watertown, MA
Client: Conley Associates/ J. Conley

PRECISION
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133334 A Volume
Site Code: 1483

Start Time	EB A.M.		EB P.M.		WB A.M.		WB P.M.		Combined A.M.		Combined P.M.		02-May-13 Thu
12:00	24		130		11		100		35		230		
12:15	20		146		18		118		38		264		
12:30	6		144		12		103		18		247		
12:45	20	70	120	540	8	49	128	449	28	119	248	989	
01:00	8		146		14		114		22		260		
01:15	12		154		14		102		26		256		
01:30	10		151		13		108		23		259		
01:45	10	40	130	581	13	54	88	412	23	94	218	993	
02:00	8		145		0		112		8		257		
02:15	2		138		3		94		5		232		
02:30	4		144		6		110		10		254		
02:45	3	17	166	593	4	13	77	393	7	30	243	986	
03:00	6		172		6		132		12		304		
03:15	6		158		9		142		15		300		
03:30	2		151		12		138		14		289		
03:45	2	16	152	633	1	28	148	560	3	44	300	1193	
04:00	6		203		6		125		12		328		
04:15	8		178		10		114		18		292		
04:30	6		182		8		92		14		274		
04:45	8	28	161	724	16	40	101	432	24	68	262	1156	
05:00	10		192		17		84		27		276		
05:15	20		192		24		87		44		279		
05:30	40		174		32		100		72		274		
05:45	46	116	193	751	44	117	128	399	90	233	321	1150	
06:00	52		189		58		133		110		322		
06:15	60		164		68		115		128		279		
06:30	105		166		96		144		201		310		
06:45	97	314	166	685	106	328	114	506	203	642	280	1191	
07:00	116		175		135		110		251		285		
07:15	139		180		160		114		299		294		
07:30	164		145		150		100		314		245		
07:45	147	566	120	620	174	619	102	426	321	1185	222	1046	
08:00	176		152		158		47		334		199		
08:15	160		100		143		101		303		201		
08:30	148		116		132		76		280		192		
08:45	152	636	114	482	138	571	80	304	290	1207	194	786	
09:00	154		90		146		80		300		170		
09:15	131		90		126		68		257		158		
09:30	127		96		138		82		265		178		
09:45	155	567	66	342	128	538	61	291	283	1105	127	633	
10:00	120		54		120		94		240		148		
10:15	122		64		132		72		254		136		
10:30	136		57		114		42		250		99		
10:45	130	508	42	217	99	465	36	244	229	973	78	461	
11:00	122		52		109		44		231		96		
11:15	128		44		117		32		245		76		
11:30	140		24		106		22		246		46		
11:45	140	530	36	156	96	428	30	128	236	958	66	284	
Total	3408		6324		3250		4544		6658		10868		
Percent	51.2%		58.2%		48.8%		41.8%						

Day Total		9732			7794			17526		

	Peak		Vol.		P.H.F.
EB A.M.	07:30	-	647	-	0.919
EB P.M.	05:00	-	751	-	0.973
WB A.M.	07:15	-	642	-	0.922
WB P.M.	03:00	-	560	-	0.946
Combined A.M.	07:30	-	1272	-	0.952
Combined P.M.	05:45	-	1232	-	0.939

TRIP GENERATION WORKSHEET

x = [24] units   LUC: Residential Condominium/Townhouse (230)

WEEKDAY

Average Rate =	5.81
Total Trips =	139.44

Fitted Curve Equation = $Ln(T) = 0.870 \cdot Ln(X) + 2.46$

Total Trips =	185.84

AM PEAK HOUR of ADJACENT STREET

Average Rate =	0.44
Total Trips =	10.56
17% of Trips In =	2
83% of Trips Out =	9

Fitted Curve Equation = $Ln(T) = 0.80 \cdot Ln(X) + 0.26$

Total Trips =	16.48
17% of Trips In =	3
83% of Trips Out =	14

PM PEAK HOUR of ADJACENT STREET

Average Rate =	0.52
Total Trips =	12.48
67% of Trips In =	8
33% of Trips Out =	4

Fitted Curve Equation = $Ln(T) = 0.82 \cdot Ln(X) + 0.32$

Total Trips =	18.65
67% of Trips In =	12
33% of Trips Out =	6

AM PEAK HOUR of GENERATOR

Average Rate =	0.44
Total Trips =	10.56
19% of Trips In =	2
81% of Trips Out =	9

Fitted Curve Equation = $Ln(T) = 0.82 \cdot Ln(X) + 0.15$

Total Trips =	15.74
19% of Trips In =	3
81% of Trips Out =	13

PM PEAK HOUR of GENERATOR

Average Rate =	0.52
Total Trips =	12.48
64% of Trips In =	8
36% of Trips Out =	4

Fitted Curve Equation = $T = 0.34(X) + 35.87$

Total Trips =	44.03
64% of Trips In =	28
36% of Trips Out =	16

SATURDAY

Average Rate =	5.67
Total Trips =	136.08

Fitted Curve Equation = $T = 3.62(X) + 427.93$

Total Trips =	514.81

PEAK HOUR of GENERATOR

Average Rate =	0.47
Total Trips =	11.28
54% of Trips In =	6
46% of Trips Out =	5

Fitted Curve Equation = $T = 0.29(X) + 42.63$

Total Trips =	49.59
54% of Trips In =	27
46% of Trips Out =	23

SUNDAY

Average Rate =	4.84
Total Trips =	116.16

Fitted Curve Equation = $T = 3.13(X) + 357.26$

Total Trips =	432.38

PEAK HOUR of GENERATOR

Average Rate =	0.45
Total Trips =	10.8
49% of Trips In =	5
51% of Trips Out =	6

Fitted Curve Equation = $T = 0.23(X) + 50.01$

Total Trips =	55.53
49% of Trips In =	27
51% of Trips Out =	28

ITE TRIP GENERATION
9TH EDITION

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TRIP GENERATION WORKSHEET

x= [2.000] 1000 SF   LUC: Specialty Retail Center (826)

WEEKDAY

| Average Rate = | 44.32 | | Fitted Curve Equation = | T = 42.87X +37.66 |
| Total Trips = | 88.64 | | Total Trips = | 123.40 |

AM PEAK HOUR of ADJACENT STREET[1]

Average Rate =	0.70		Fitted Curve Equation =	Not Given
Total Trips =	1		Total Trips =	
61% of Trips In =	1		61% of Trips In =	
39% of Trips Out =	0		39% of Trips Out =	

PM PEAK HOUR of ADJACENT STREET

Average Rate =	2.71		Fitted Curve Equation =	T = 2.40X + 21.48
Total Trips =	5.42		Total Trips =	26.28
44% of Trips In =	2		44% of Trips In =	12
56% of Trips Out =	3		56% of Trips Out =	15

SATURDAY

| Average Rate = | 42.04 | | Fitted Curve Equation = | Not Given |
| Total Trips = | 84.08 | | | |

SATURDAY PEAK HOUR of GENERATOR[2]

Average Rate =	3.52		Fitted Curve Equation =	Not Given
Total Trips =	7.04		Total Trips =	
52% of Trips In =	4		52% of Trips In =	
48% of Trips Out =	3		48% of Trips Out =	

LUC: Shopping Center (820)

AM PEAK HOUR of ADJACENT STREET

Average Rate =	0.96		Fitted Curve Equation =	Ln (T) = 0.61* Ln(X) +2.24
Total Trips =	1.92		Total Trips =	14.34
62% of Trips In =	1		62% of Trips In =	9
38% of Trips Out =	1		38% of Trips Out =	5

PM PEAK HOUR of ADJACENT STREET

Average Rate =	3.71		Fitted Curve Equation =	Ln (T) = 0.67* Ln(X) +3.31
Total Trips =	7.42		Total Trips =	43.57
48% of Trips In =	4		48% of Trips In =	21
52% of Trips Out =	4		52% of Trips Out =	23

SATURDAY PEAK HOUR of GENERATOR

Average Rate =	4.82		Fitted Curve Equation =	Ln (T) = 0.65* Ln(X) +3.78
Total Trips =	9.64		Total Trips =	68.75
52% of Trips In =	5		52% of Trips In =	36
48% of Trips Out =	5		48% of Trips Out =	33

ITE TRIP GENERATION
9TH EDITION

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[1] AM PEAK HOUR of ADJACENT STREET determined through ratio of Shopping Center (LUC 820)
AM peak hour of adjacent street and PM peak hour of adjacent street.   (0.96/3.71)*2.71 =.701

[2] Sat. PEAK HOUR of GENERATOR determined through ratio of Shopping Center (LUC 820)
Sat. peak hour of generator and PM peak hour of adjacent street.   (4.82/3.71)*2.71 =3.552